

Facilitators and barriers for the adoption, implementation and monitoring of child safety interventions: a multinational qualitative analysis

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ABSTRACT

The efficiency and effectiveness of child safety interventions are determined by the quality of the implementation process. This multinational European study aimed to identify facilitators and barriers for the three phases of implementation: adoption, implementation and monitoring (AIM process). Twenty-seven participants from across the WHO European Region were invited to provide case studies of child safety interventions from their country. Cases were selected by the authors to ensure broad coverage of injury issues, age groups and governance level of implementation (eg, national, regional or local). Each participant presented their case and provided a written account according to a standardised template. Presentations and question and answer sessions were recorded. The presentation slides, written accounts and the notes taken during the workshops were analysed using thematic content analysis to elicit facilitators and barriers. Twenty-six cases (from 26 different countries) were presented and analysed. Facilitators and barriers were identified within eight general themes, applicable across the AIM process: management and collaboration; resources; leadership; nature of the intervention; political, social and cultural environment; visibility; nature of the injury problem and analysis and interpretation. The importance of the quality of the implementation process for intervention effectiveness, coupled with limited resources for child safety makes it more difficult to achieve successful actions. The findings of this study, divided by phase of the AIM process, provide practitioners with practical suggestions, where proactive planning might help increase the likelihood of effective implementation.

INTRODUCTION

There is a strong evidence base of effective child safety interventions that has been established over the last few decades.^{1–4} Many of these interventions have been implemented, and in the WHO European Region between 2000 and 2011, the number of deaths among children (0–14 years) due to injury has decreased by 44%.⁵ However, not all children in Europe enjoy the same level of protection. Child injury rates vary between and within countries and the gap in Europe, between high-income countries and low/middle-income countries, has widened.⁵

Widespread implementation of evidence-based child safety interventions, at all levels of governance, is one way to approach the problem.⁶ However, there are some important considerations

during implementation. The implementation process itself is a determinant of intervention effectiveness: programmes that have been carefully implemented and are unimpeded by serious implementation problems are associated with better outcomes.⁷ In addition, the sustainability of interventions plays a role. Insufficient intervention duration can affect whether an intervention is effective.⁸

Despite the importance of implementation, scientific research in injury prevention is largely focused on outcome as opposed to process providing practitioners with little guidance as to *how* to make an intervention work.^{9–13}

Several reviews have investigated the implementation process in different health contexts, such as diffusion of innovation within organisations and implementation practices in mental health and nursing.^{14–16} Regrettably, child safety interventions were not included in these large reviews.

There have, however, been a few studies addressing implementation issues specific to injury prevention. Brussoni *et al*⁹ explored a methodology to bring together scientific evidence and practitioner experience using the case of smoke alarm installation. The sustainability of community-based injury prevention interventions and the role of factors such as structure, process and context in the effectiveness of such interventions have been studied by Nilsen *et al* (2004, 2005).^{8, 17} In addition, the feasibility of policy transfer for unintentional injury has been investigated.¹⁸ A recent study by Rothman *et al*¹⁹ explored the facilitators and enablers to enact child and youth injury prevention legislation in Canada. Finally, conceptual work by Bugeja *et al*²⁰ addresses the research to practice gap in injury prevention by proposing a public policy approach to injury prevention, described from the practitioner's perspective.

Findings of these studies are broad, including the importance of windows of opportunity,²⁰ resources,^{9, 18, 19} and the challenges of multisectoral working.⁹

This qualitative study aims to build on this evidence base with a focus on child safety in a multinational context. The aim was to identify facilitators and barriers to adoption, implementation and monitoring of child safety interventions.

METHODS

The study emerged within a large-scale European Union (EU) project: Tools to Address Childhood Trauma and Children's Safety (TACTICS).²¹ The



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implementation process was broken down into three broad phases: adoption, implementation and monitoring of good practice child safety interventions, referred to collectively as the AIM process. These phases constitute a simplified and condensed version of the stages of implementation as described by Fixsen *et al.*,²² with additional emphasis on monitoring.

Definitions

By adoption, the authors refer to an explicit decision to take up an intervention. Implementation signifies action taken to put into operation an intervention including, as appropriate, enforcement activities. Monitoring denotes the collection and analysis of data for the specific purpose of examining how well an intervention is being implemented and its impact.

Data collection

Participants were invited to prepare a case study (presentation and a written account) of a good practice child safety intervention that had been implemented in their country.

To ensure broad coverage of the child safety field, one of the authors (JMM) developed a matrix, which was reviewed by the TACTICS scientific committee. The scope of the TACTICS project influenced the choice of injury categories due to its focus on the injury domains road, water and home safety and intentional injury prevention. To populate the matrix, participants were asked to submit good practice interventions from their countries (good practice as defined in the European Child Safety Alliance (ECSA) Child Safety Good Practice Guide).² Cases were selected by the authors of this study to maximise coverage of issues and age groups, as well as to represent the governance level of implementation (eg, national, regional or local).

The participants prepared their presentation using a template and guidelines developed by the authors (see online supplementary appendix 1), which specifically elicited facilitators and barriers for each stage of the AIM process.

The presentations were made during two workshops that took place in Rome, Italy, in October 2011 and Copenhagen, Denmark, in May 2012. Each presentation was approximately 15 min duration. A data extraction form (see online supplementary appendix 2) was used to record details of the presentations. A question and answer session, attended by all the participants and four of the authors (BS, PS-B, JMM and JV), followed the presentations. The aim of the question and answer sessions was to clarify any unclear details and to allow free discussion to take place. Both the presentations and the question and answer sessions were audio recorded. Following the two workshops, participants wrote up their case studies using another template and guidelines (see online supplementary appendix 3) allowing them to elaborate on details of the cases.

Participants

Participants in the study were representatives from member organisations of the ECSA. The participants were either partners on the TACTICS project or individuals chosen by the project partner. Each participant represented a different country.

Ethics

Ethical approval was not sought because the scope of the study is not considered human subjects research according to the Dutch Medical Research Involving Human Subjects Act.²³ Correspondingly, the ethics committee of Maastricht University does not review proposals that fall outside this definition.

Nevertheless, all participants signed a project agreement as part of an EU-funded project that covered issues such as use of data and publication. Participants were informed ahead of time that presentations would be recorded.

Data analysis

Data analysis was done in three stages. In stage 1, one of the authors (BS) used thematic content analysis²⁴ to analyse and code the data for statements of facilitators and barriers for each phase of the AIM process: adoption, implementation and monitoring. Phase 1 was concluded when all the data had been analysed and no new statements were found (data saturation). The result of phase 1 was a list of facilitator and barrier statements grouped to the phase of the AIM process to which they applied. Data analysis was conducted by hand and with the use of Microsoft Excel.

In the second stage of analysis, four of the authors (BS, PS-B, KF and JMM) independently reviewed and grouped the statements into logical themes. The themes suggested by each author were then collated and harmonised, with the agreement of all the authors, into a final list of themes. The participation of the group helped ensure quality and increase objectivity.²⁵

In the final phase of the analysis, four of the authors (BS, PS-B, KF and JMM) were asked to resort the statements, this time among the list of agreed themes. The author leading the analysis (BS) collated the results and where there were differences, the final content of each theme was agreed among all of the authors by consensus.

RESULTS

Twenty-six cases from 26 countries in the WHO European Region were included in the study (table 1). Cases were included from six of the seven original categories of the matrix. The planned case for child maltreatment prevention was not included, as the participant was unable to present and attend the workshop.

Data analysis was performed using three sources of data: the presentation slides, the written accounts and the notes taken during the workshop. In addition, we used the audio recordings to clarify and verify points; however, they were not transcribed.

The number of facilitators or barriers identified within the case studies decreased over the three phases of the AIM process. None of the case studies identified both facilitators and barriers for all three of the phases of the AIM process. The highest number of statements occurred for barriers to adoption, which had 24 statements and the lowest was 10 statements for facilitators to monitoring.

Categorisation of the statements and harmonisation of the results produced eight general themes applicable across the AIM process: management and collaboration, resources, leadership, nature of the intervention, political, social and cultural environment, visibility, nature of the injury problem and analysis and interpretation. A short description of each theme, where in the AIM process it appears and whether it was a facilitator or barrier, is displayed in table 2.

Adoption phase

The adoption phase (table 3) was generally characterised by facilitators and barriers to establish a collaborative partnership and building momentum for the AIM process. Strong leadership and commitment among project partners to the intervention was a facilitator. Participants described how taking a win-win approach to collaboration helped to maintain commitment and strengthen partnerships. The availability of resources (financial, human—

Table 1 The cases and countries included in the study

Injury domain	Name of intervention	Age group	Country
Road safety	National Road Safety Campaign	Preschool and school age	Belgium
	'Respect Our Signs' Croatian national Road Safety Programme	School age	Croatia
	The Safe Routes to School pedestrian safety project, Odense Municipality	School age and adolescent	Denmark
	Tax reduction on child passenger restraint systems	Preschool	Portugal
Water safety	'Stop traffic accidents! Life has priority' Road safety campaign	School age and adolescent	Romania
	Swimming pool safety legislation	Preschool	France
	Drowning prevention programme	Preschool and school age	Iceland
	Promoting life jacket use	Preschool and school age	Ireland
Home safety	National swim diploma programme 'Swim ABC'	School age	The Netherlands
	Swimming school for all; training bilingual swimming teachers	Preschool and school age	Sweden
	'Bärenburg' (Child Safety House)	Preschool and school age	Austria
	'Safe at Home' National Home Safety Equipment Scheme	Preschool	England
	'Beware Poisonous!'—Avoid poisoning in immigrant families	Preschool	Germany
	Voluntary Standards for Safe Homes for Children	Preschool and school age	Israel
	Involving family doctors in child safety measures	Preschool, school age and adolescent	Latvia
	Public playgrounds—requirements for public playground safety and their management	Preschool and school age	Malta
	Prevention of burn injuries in Harstad	Preschool	Norway
	National Blind Cord Safety Campaign	Preschool	Scotland
Suicide prevention	National home visiting programme for families with newborns	Preschool	Slovenia
	The National Suicide Prevention Project	Adolescent	Finland
Peer violence prevention	Suicide and self-harm prevention	Adolescent	Greece
	Stop Bullying: A nationwide school campaign	School age and adolescent	Lithuania
Data and monitoring	Stop Bullying: A nationwide school campaign	School age and adolescent	Slovakia
	Health Behaviour in School-aged Children (HBSC) study as a potential source of monitoring	School age	Hungary
	Working with coroners to improve child injury monitoring in Catalonia	Preschool, school age and adolescent	Spain
	All Wales Injury Surveillance System, emergency department data collection	Preschool, school age and adolescent	Wales

Table 2 Identified themes within the adoption, implementation and monitoring (AIM) process

Theme	Adoption		Implementation		Monitoring	
	Barrier	Facilitator	Barrier	Facilitator	Barrier	Facilitator
<i>Management and collaboration</i>		✓	✓	✓	✓	✓
Efficient management of whole AIM process (planning, organising, controlling resources, meeting deadlines and achieving predetermined goals. Successful collaboration; building and maintaining partnerships, ensuring clarity among partner roles, managing large and diverse teams						
<i>Resources</i>	✓	✓	✓	✓	✓	✓
Financial and human (adequate number and relevant skill set) resources, availability of data, time constraints						
<i>Leadership</i>	✓	✓	✓	✓		✓
Formal leadership—with formal responsibility to deliver, informal leadership—no formal responsibility but influence (ie, champion)						
<i>Nature of intervention</i>	✓	✓	✓	✓	✓	✓
Design of intervention, existing supporting evidence, established need, possibility to adapt to local environment, presence of pilot						
<i>Political, social and cultural environment</i>	✓	✓	✓	✓		
Presence of supportive or unsupportive political social or cultural environment, existing laws, international or national policy agenda						
<i>Visibility</i>	✓	✓		✓		
Public demand or concern about injury, media coverage, government focus on injury						
<i>Nature of injury problem</i>	✓		✓		✓	
Complexity of injury as public health issue, intersectoral nature, unclear location of responsibility for prevention, taboo nature of some issues (eg, suicide), difficulties regarding data availability						
<i>Analysis and interpretation</i>					✓	
Difficulties encountered during data analysis and interpretation of results						

including appropriate skills, time and data) was centrally important. Local data were used to assess the state of affairs and demonstrate the need for action, while comparative data highlighted inequalities or a low performance compared with neighbouring countries.

Aspects of the intervention itself facilitated or hindered adoption. High-quality, inexpensive interventions, with good evidence of efficacy, previously trialled in other countries were easier to adopt. Interventions that constituted an extension of

Table 3 Facilitators and barriers identified at the adoption phase

Themes	Facilitators	Barriers
Management and collaboration	<ul style="list-style-type: none"> Clear role of leading organisation as coordinator of partners Commitment to the intervention among partners Win-win approach to collaboration Existing organiser's network Internal collaboration among organisers and with external organisations Organisations with good reputations 	
Resources	<ul style="list-style-type: none"> Availability of funding Sufficient time Availability of personnel with the appropriate skills Availability of data Key figure or organisation providing technical skills and/or data 	<ul style="list-style-type: none"> Lack of funding Lack of time Lack of personnel Lack of sufficiently trained personnel Lack of infrastructure
Leadership	<ul style="list-style-type: none"> Leading figure(s) with many contacts Strong political will Establishment of new government entity Key figure initiating data collection National/top-down initiative 	<ul style="list-style-type: none"> Local resistance to change among organisations affected by intervention Lack of leadership among partnering organisations
Nature of the intervention	<ul style="list-style-type: none"> High-quality intervention (good evidence of efficacy) Low funding requirements Economic incentive for enforcement Intervention already trialled in another country or region Intervention constituted extension of existing programme Experience from other (comparable) countries Integrated preintervention research (eg, needs assessment) 	<ul style="list-style-type: none"> Pioneering a new strategy Internal disagreement among project partners regarding aspects of the intervention (eg, differing visions of how the intervention would be when implemented) Design of safety device—unappealing to public
Political, social and cultural environment	<ul style="list-style-type: none"> Previous and current national gov. policies/reports/strategies/agendas/enquiries Relevant international reports/strategies Incoherent existing policies causing controversy Cross-sectoral committee/support Existing safety laws 	<ul style="list-style-type: none"> Lack of safety culture among population Linguistic or cultural challenges Armed conflict Lack of clarity regarding confidentiality of data
Visibility	<ul style="list-style-type: none"> Wide public recognition of problem (eg, media focus on injury issue) Media campaign/media participation/ publicity events Public and governmental pressure Window of opportunity to spur government action 	<ul style="list-style-type: none"> Lack of public demand Issue not prioritised in government strategy Local government apathy Low media visibility
Nature of the injury problem		<ul style="list-style-type: none"> Intersectoral nature of child injury prevention—shared or unclear responsibility Taboo subject (eg, suicide)

existing programmes and those with integrated preintervention research (eg, a needs assessment) also facilitated adoption. Interventions that were completely new were more difficult to adopt.

Political and public recognition of an issue facilitated adoption. Participants described how strong media coverage surrounding even a single injury event could benefit their campaign. Equally a lack of public demand, lack of government prioritisation and local government apathy were barriers to adoption. The nature of injury as a public health issue was a challenge at the adoption stage (eg, the need for multisectoral collaboration led to confusion among sectors concerning responsibility to act).

Implementation phase

Findings for the implementation phase (table 4) focused on maintenance of the collaborative partnership and progression through the AIM process. Facilitators included factors

promoting partnership and leadership stability (such as organised, respected and enthusiastic partners). Routine project evaluation revealed problems and helped to solve them. A lack of evaluation was a barrier, particularly in the context of prolonging an existing intervention and learning from or demonstrating previous experience.

Availability of sufficient resources, to match the intervention (and ideally its potential evolution), was essential. Difficulties regarding funding were said to impact human resource availability due to the time investment needed to secure funds. Some human resource issues were tangible (eg, lack of skills) and some were presented as more subjective (eg, staff fear of an increased workload); staff training and capacity building were cited as ways to address these issues.

Changes in the political, social and cultural environment affected the implementation phase and managing these changes required a flexible and innovative approach. High visibility of the injury issue and wide publicity of the intervention (eg,

Table 4 Facilitators and barriers identified at the implementation phase

Themes	Facilitators	Barriers
Management and collaboration	Common understanding of long-term nature of AIM process Cooperation with academic institution Enthusiasm from partners Local partnerships Partner's network Partners organised and respected Routine monitoring and evaluation from outset	Cooperation problems with existing partners Failure by partners to meet deadlines Internal organisational changes Poor internal understanding of implementation Problems establishing partnerships Lack of clarity regarding partner roles Resistance among partners to comply with the central scheme Lack of monitoring
Resources	Availability of funding Fundraising support from local organisations Funds allocated to media campaign Staff training as part of scheme set-up In kind support from professionals Production and distribution of supporting educational materials	Lack of funding Lack of sufficiently trained personnel Heavy workload or fear of increased workload Lack of volunteers Short time frame Lack of data
Leadership	Good internal leadership of consortium: central administration, support and information Stability of key figures and personnel Interministerial cooperation Committed champions National/top-down initiative	Challenges for national organisation to act locally Policy maker misunderstanding problem Resignation of champion
Nature of the intervention	Robust intervention Pilot phase with good results Cofinancing/cobenefits for partners Links to other projects Existing intervention with own resources (protocol/educational material) No-charge nature of intervention (eg, free equipment and fitting) Action taken from beginning to properly address target population Strong research base and reliable data Compliance with intervention easy and not too expensive Legal clarity	Difficulties encountered when adapting intervention to setting Large and complex interventions Efficacy of recommended items questionable Voluntary nature of participation (eg, voluntary standards) Misunderstanding/lack of resources among enforcers Confusion among consumers
Political, social and cultural environment	Change in national agenda Better designed safety products on the market Existing legislation	Change in political climate Lack of safety culture among population Circumstances relating to armed conflict
Visibility	Interest in safety gave rise to a new market for safety equipment Problem addressed was widely recognised Publicity	
Nature of the injury problem		Taboo subject (eg, suicide) Relatively low number of child deaths

AIM, adoption, implementation and monitoring.

media interest and a dedicated website) was a facilitator. In addition, the sense that the problem being addressed was widely recognised drove momentum among organisers and decision makers.

Monitoring phase

Factors affecting the monitoring phase (table 5) were more centred on the feasibility of monitoring and some seemed to consider it an optional phase. Leadership facilitated monitoring if, for example, an external organisation, leader or champion required an evaluation as part of their participation. Likewise partnerships with institutions such as national research institutes or universities helped.

The availability (or lack) of appropriate data was particularly relevant for monitoring. Practitioners aiming to establish a correlation between an intervention and a reduction in injury over time struggled to provide strong support using robust measures such as mortality rates. Moreover, it was said to be challenging to establish both baseline and follow-up measures for most injuries, because few countries have good data on non-fatal injuries, and minor injuries are not well captured by routine data collection methods.

Monitoring was, however, facilitated by predefined milestones, set project costs (including budgeting for monitoring) and integrated strategic indicators. Indicators could be continually monitored while detailed reports of milestones and project costs contributed to efforts to monitor progress. Interventions with a needs assessment (carried out during the adoption phase) also facilitated monitoring by providing a baseline of the situation before the intervention was implemented.

DISCUSSION

This multinational study explored facilitators and barriers to the implementation process of child safety interventions. Participants presented their experiences of the AIM process and data analysis revealed eight themes: management and collaboration, resources, leadership, nature of the intervention, political, social and cultural environment, visibility, nature of the injury problem and analysis and interpretation.

Many of the themes identified were simply facilitators if present and barriers if absent. For example, resources are an advantage when present and a barrier when not. However, the discussions during the question and answer sessions that followed the presentations indicated that some of the facilitators

Table 5 Facilitators and barriers identified at the implementation phase

Themes	Facilitators	Barriers
Management and collaboration	<ul style="list-style-type: none"> Definition of milestones at outset Strategic indicators put in place in business plan Detailed project costs set out from beginning Mixed research methods (surveys, case studies, etc) Minutes/agendas of all meetings Possible risks identified and monitored in advance Data collected throughout scheme Role of external company, sponsor or organisation with own evaluation requirements 	<ul style="list-style-type: none"> Poor coordination Lack of process evaluation
Resources	<ul style="list-style-type: none"> Infrastructure Availability of data 	<ul style="list-style-type: none"> Lack of funding Lack of personnel Lack of sufficiently trained personnel Lack of infrastructure Time-consuming process Lack of international comparator Lack of routine data collection No data to control for external factors No data to evaluate change in attitudes/awareness Short time frame of activities
Leadership	<ul style="list-style-type: none"> Support from ministry Evaluation requirements from external organisations 	
Nature of the intervention	<ul style="list-style-type: none"> Preceding research (eg, needs assessment during adoption phase) 	<ul style="list-style-type: none"> Challenges regarding accessibility of the target population for monitoring (eg, illiteracy) Diverse groups using intervention Nature of injury—low mortality/minor injuries
Nature of the injury problem		
Analysis and interpretation		<ul style="list-style-type: none"> Difficulties establishing intervention effectiveness due to complexity Comparability of results Complexities in data treatment for (multiple user types, or data sources) Difficult to transform data for policy making

and barriers were not independent. For instance, a well-integrated leader as part of a collaboration involving organisations with a good track record and reputation was reported to increase the likelihood of an intervention receiving funding. This was also true for barriers such as a lack of data; in one case, the presence of a key individual enabled them to initiate data collection. In this sense, there is interconnectedness between the themes we have identified and the facilitators and barriers contained within them. This idea is supported by findings from Nilsen *et al*⁸ where they discuss the interconnectedness of factors and the dangers of focusing too heavily on single factors while ignoring others.

Likewise, there seemed to be interconnections across the whole AIM process. The findings suggested that effort invested in the adoption phase appeared to pay off in later phases of implementation and monitoring. For example, building commitment to an intervention by using a win-win approach to collaboration and building a strong team early in the process appeared to contribute to other facilitators in the implementation phase, such as enthusiasm among partners, and a common understanding of the long-term nature of the process. This idea is supported by experiences in sports injury prevention²⁶ and mental health practices.^{22, 27}

The AIM process also appeared to be somewhat cyclical. Participants described how demonstrated efficiency in previous interventions helped them to secure funding and support for intervention extensions and new interventions. However, many of the participants of this study did not report on the monitoring of their interventions. This was because either the intervention had not yet reached the monitoring phase or because monitoring had not taken place. This apparent lack of

intervention monitoring is concerning as progress in the field of injury prevention will not be achieved without effective evaluation.²⁸

Many parallels exist between our findings and the findings of implementation studies in injury prevention and other fields. The Quality Implementation Framework from Meyers *et al*¹⁶ is based on a synthesis of 25 frameworks and refers to many of the facilitators and barriers identified over the AIM process in this study. The role of, and interaction between, formal and informal leadership is explored in detail by Bryson *et al*²⁹ and Armistead *et al*.³⁰ In addition, Huxham³¹ provides a detailed overview of the management issues involved in joint working across organisations, reflecting findings such as the benefit of clear aims and roles, the need to understand the long-term nature of the process and difficulties for the collaborative partnership if a key individual is lost.

Nilsen *et al*⁸ elaborate on the challenge to achieve effective leadership, without relying too heavily on a single individual. A possible solution to this might be found in the approach taken by Donaldson *et al*²⁶ to use intervention mapping as a way to create an implementation structure potentially more resilient to change.

From the injury prevention literature, our findings on the importance of policy windows and the benefit of national leadership are supported by several studies.^{9, 19, 20} Barriers identified within the theme management and collaboration (eg, challenges for multisector partnerships) and within the theme resources (challenge of short-term and inflexible funding arrangements) are also supported.⁹

Participant experiences contained in the theme visibility drew our attention to particularities for injury prevention among

children also described by Rothman *et al.*¹⁹ The importance of visibility (ie, political and public recognition) of the issue is an important aspect of implementation, particularly in multisectoral collaborations.³² Participants of this study reported that emotive single injury events among children could increase public awareness of the issue. High-profile cases of an injured child could be seen as an opportunity (although a sad one) for injury prevention practitioners to draw attention to the issue, launch an intervention or highlight the preventable nature of injury and demand action. Social media may be a useful tool in this regard.³³ In this sense, the political, social and cultural environment plays a significant role in visibility. As described by Hanson *et al.*,¹⁰ 'science can make a difference provided that research evidence is injected into public discourse in a way that is meaningful to policy makers, politicians and the general public'.

Limitations

There are some limitations to this study. First, although participants were encouraged to collaborate with others involved in the intervention on which their case study was based, this was not always possible. Some cases were presented from one person's perspective, while others were delivered by someone that had not been personally involved in the intervention. In the latter case, the presentation had been produced using interviews with relevant stakeholders. These issues may affect the validity of some of the facilitators and barriers identified.

Second, the level of detail in the presentations and written case studies varied. None of the case studies identified facilitators and barriers for all three of the stages of the AIM process and the number of facilitators and barriers decreased over the three phases. As a result, cases that provided a high level of detail may be overrepresented in the results and the adoption and implementation phases are likely to be better explored than the monitoring phase. The lack of detail regarding the monitoring phase may be due to a lack of intervention monitoring in the injury field or response fatigue among participants as the monitoring section was the last reporting section.

The presentations and written case studies were completed in English, which while the working language in the field was the second language for most participants. This was a challenge for some and is reflected in reduced detail in the written summary of the case studies. However, the question and answer sessions did allow clarification when questions arose. Overall, the consistency in facilitators and barriers identified across the interventions, which represented both different areas of child injury and the views, and experiences of practitioners working in child injury in 26 different countries suggest a reasonable level of validity.

CONCLUSION

This study identified facilitators and barriers to the AIM process of child safety good practice interventions. Major facilitators were effective management and collaboration, sufficient resources, a high-quality intervention and receptive political, social and cultural environment. Dominant barriers were lack of resources, lack of political support (leadership) and problems surrounding building and sustaining multisectoral collaborations (management and collaboration). In addition, facilitators in the area of visibility such as making use of a high media focus on a child injury event were highlighted.

To our knowledge, this is the first multinational study of the implementation process for child safety good practice interventions. The findings, divided by phase of the AIM process,

demonstrate the importance of each phase and provide practitioners with suggested areas where proactive planning might help increase likelihood of effective implementation.

We believe that the field would benefit from further qualitative research based on the themes identified in this study. For example, research exploring the interconnectedness between the facilitators and barriers and the themes and phases of the AIM process. In addition, looking at specific mechanisms to overcome some of the barriers and identifying strategies to capitalise on facilitators would be a welcome contribution to the field.

What is already known on the subject?

- Wide implementation of evidence-based child safety interventions is required to protect children from the risks of injury. However, the quality of the implementation process is a determinant of intervention effectiveness; higher levels of implementation are associated with better outcomes.

What this study adds?

- This study compiled experiences of the implementation process from across Europe. The facilitators and barriers and the corresponding themes identified could help child safety practitioners avoid or manage obstacles and build in factors that will improve the quality of intervention implementation.

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REFERENCES

- 1 Towner E, Mytton J. Prevention of unintentional injuries in children. *Paediatr Child Health* 2009;19:517–21.
- 2 Mackay M, Vincen J, Brussoni M, *et al.* *Child Safety Good Practice Guide: good investments in unintentional child injury prevention and safety promotion*. Amsterdam: European Child Safety Alliance, Eurosafe, 2006.
- 3 Mackay M, Vincen J, Brussoni M, *et al.* *Child Safety Good Practice Guide: good investments in unintentional child injury prevention and safety promotion: Addendum 2010*. Amsterdam: European Child Safety Alliance, Eurosafe, 2010.
- 4 Sethi D, Raccoppi F, Baumgarten I, *et al.* *Injuries and violence in Europe: why they matter and what can be done*. Copenhagen: WHO Regional office for Europe, 2006.
- 5 Gopfert A, Sethi D, Rakovac I, *et al.* Growing inequalities in child injury deaths in Europe. *Eur J Public Health* 2015;25:1–3.
- 6 Sethi D, Towner E, Vincen J, *et al.* *European report on child injury prevention*. Copenhagen: WHO Regional Office for Europe, 2008.
- 7 Durlak JA, DuPre EP. Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *Am J Community Psychol* 2008;41:327–50.
- 8 Nilsen P, Timpka T, Nordenfelt L, *et al.* Towards improved understanding of injury prevention program sustainability. *Saf Sci* 2005;43:815–33.
- 9 Brussoni M, Towner E, Hayes M. Evidence into practice: combining the art and science of injury prevention. *Inj Prev* 2006;12:373–7.

- 10 Hanson DW, Finch CF, Allegrante JP, *et al.* Closing the gap between injury prevention research and community safety promotion practice: revisiting the public health model. *Public Health Rep* 2012;127:147–55.
- 11 Finch C. Implementing and evaluating interventions. In: Li G, Baker SP, eds. *Injury research: theories, methods and approaches*. Boston, MA: Springer US, 2012:619–39.
- 12 Arai L, Roen K, Roberts H, *et al.* It might work in Oklahoma but will it work in Oakhampton? Context and implementation in the effectiveness literature on domestic smoke detectors. *Inj Prev* 2005;11:148–51.
- 13 McClure RJ, Davis E, Yorkston E, *et al.* Special issues in injury prevention research: developing the science of program implementation. *Injury* 2010;41(Suppl 1): S16–19.
- 14 Fixsen DL, Blase KA, Naoom SF, *et al.* Core Implementation components. *Res Soc Work Pract* 2009;19:531–40.
- 15 Greenhalgh T, Robert G, Macfarlane F, *et al.* Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q* 2004;82:581–629.
- 16 Meyers DC, Durlak JA, Wandersman A. The quality implementation framework: a synthesis of critical steps in the implementation process. *Am J Community Psychol* 2012;50:462–80.
- 17 Nilsen P. What makes community based injury prevention work? In search of evidence of effectiveness. *Inj Prev* 2004;10:268–74.
- 18 Vlachantoni IT, Ntinapogias A, Petridou E. Implementation of effective policies for the prevention of unintentional injuries: a feasibility study in European countries. *J Public Health* 2013;21:97–107.
- 19 Rothman L, Pike I, Belton K, *et al.* Barriers and enablers to enacting child and youth related injury prevention legislation in Canada. *Int J Environ Res Public Health* 2016;13:656.
- 20 Bugeja L, McClure RJ, Ozanne-Smith J, *et al.* The public policy approach to injury prevention. *Inj Prev* 2011;17:63–5.
- 21 Tools to Address Childhood Trauma and Children's Safety (TACTICS) funded by the European Commission under the EU Health Programme 2008–2013 project number 20101212. <http://www.childsafetyeuropa.org/tactics/index.html> (accessed Oct 2016).
- 22 Fixsen DL, Naoom SF, Blase KA, *et al.* *Implementation research: a synthesis of the literature*. Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network, 2005:12–21.
- 23 Central Committee on Research Involving Human Subjects Research (CCMO). <http://www.ccmo.nl/en/medical-scientific-research-and-the-wmo> (accessed Oct 2016).
- 24 Green J, Thorogood N. *Qualitative methods for health research*. Sage, 2013.
- 25 Flick U. *An introduction to qualitative research*. Sage, 2009.
- 26 Donaldson A, Lloyd DG, Gabbe BJ, *et al.* We have the programme, what next? Planning the implementation of an injury prevention programme. *Inj Prev* 2016; Published Online First: 19 Ajn 2016. doi:10.1136/injuryprev-2015-041737
- 27 Seffrin B, Panzano PC, Roth D. What gets noticed: how barrier and facilitator perceptions relate to the adoption and implementation of innovative mental health practices. *Community Ment Health J* 2008;44:475–84.
- 28 Doll L. Evaluation of interventions designed to prevent and control injuries. *Epidemiol Rev* 2003;25:51–9.
- 29 Bryson JM, Crosby BC, Stone MM. The design and implementation of cross-sector collaborations: propositions from the literature. *Publ Admin Rev* 2006;66:44–55.
- 30 Armistead C, Pettigrew P, Aves S. Exploring leadership in multi-sectoral partnerships. *Leadership* 2007;3:211–30.
- 31 Huxham C. Theorizing collaboration practice. *Public Manag Rev* 2003;5:401–23.
- 32 Freiler A, Muntaner C, Shankardass K, *et al.* Glossary for the implementation of Health in All Policies (HiAP). *J Epidemiol Community Health* 2013;67:1068–72.
- 33 Krug EG. Next steps to advance injury and violence prevention. *Inj Prev* 2015;21: e2–3.

Why birds collide with vehicles

To better understand birds' responses to approaching vehicles, researchers at the USDA Wildlife Services' National Wildlife Research Center placed captive brown-headed cowbirds in a simulation chamber. The birds watched videos of vehicles approaching at various speeds. Researchers discovered that the birds could successfully avoid slower moving vehicles, but could not escape if the speed was over 75 mph. Comment: As is true for humans!

Fourth United Nations Global Road Safety week

A main theme of the upcoming Global Road Safety week is to push for a general reduction in the speed of cars. Comment: This single measure could have the greatest chance of reducing road deaths and injuries.

Questions about Black Hawk crash

The crash of a Black Hawk helicopter in 2015 caused US\$7 million in damage to the aircraft and the injuries to four crew members cost the Army US\$2.3 million. The cause of the crash has not been revealed but questions have arisen about maintenance and the rescue itself. The aircraft had 6392 flight hours and was not considered airworthy. The communications plan during rescue was confused because of a shortage of frequencies and a flight surgeon was available but was not part of the rescue crew.

Gasoline sniffing and suicide

Canada's treatment of Aboriginals has been deplorable for decades and injury rates, including suicides, among these communities are far higher than elsewhere. In the 1970s, there was an epidemic of gas sniffing among young Aboriginals resulting in increases in blood lead levels. There is now speculation that the resulting brain damage may be related to the high suicide rates. A paper in *Psychiatry Research* suggests the mechanism may involve genetic changes resulting in depression.